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ABSTRACT

This case study describes a preservice program for prospective high school science teachers at Monash University in Victoria, Australia. The program views student teaching as only the first stage of career-long professional development, promotes the notion of the reflective practitioner, maximizes student teachers' contacts with school pupils and teachers, and defines pedagogy with a focus on constructivist research. The preservice program has evolved in response to research and continues to evolve. a considerable proportion of the research had been conducted as part of this program. The research-derived principles underlying the preservice program are considered. Salient issues in the research-practice interplay are discussed, including the requirements of professional registration to teach in Victoria, the problem of some faculty members wanting to abandon preservice teacher education, low academic status of preservice teacher education, and isolation of preservice from ongoing professional development. (JDD)

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INTERPLAY BETWEEN RESEARCH AND PRACTICE: A CASE STUDY OF A PRESERVICE TEACHER EDUCATION COURSE

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Introduction

The context for this consideration of issues arising from attempts to implement research is the preservice program for prospective high school science teachers at Monash University. It is a rather tangled context: the preservice program has evolved over the last fifteen years in response to research, and continues to evolve; a considerable proportion of this research had been conducted as part of this particular program. That is, this is not a situation in which completed research is taken and then used to influence practice. Rather, this context is one in which the research, the implementation of the research, and the tensions arising from research - practice interplay are much more intertwined.

We begin the paper with a brief consideration of the research derived principles which we are consistently attempting to implement, and some relevant descriptions of our program. We then consider salient issues in the research-practice interplay. This is done via consideration of issues/problems which impinge on our attempts to implement research. These impinging issues/problems are considered in two broad groups: those to which we are yet essentially unable to respond and those to which we have been able to respond in some appropriate form.

The research in question - The principles underlying the preservice program

Accounts of the program, of the principles on which it is based, of the research underlying these principles, and of case studies of the program already exist (eg. Gunstone and Northfield, 1992; Gunstone et al., 1993). In particular the seven principles which we attempt to implement, and discussion of the research argued to lead to these principles, are in Gunstone et al. (1993). These seven principles are:

1. The prospective teacher has needs which must be considered in planning and implementing the program, and which change through his/her preservice development;
2. The transition from learner to teacher is fundamental and difficult, and is greatly facilitated when intending teachers work closely with their colleagues;
3. The student teacher is a learner who is actively constructing views of teaching and learning based on personal experiences and strongly shaped by conceptions/ perspectives/attitudes/skills previously constructed and now brought to the course;
4. Since all teacher educators model teaching for their students, the program should model those approaches being advanced in the program;
5. Student teachers should see the preservice program as an educational experience of worth, but also as only the first stage of career-long professional development;

6. Preservice education is, by definition, inadequate for preparing quality teachers;
7. The notion of the reflective practitioner is a vital model for those teaching the preservice program.

As we have noted previously, aspects of a number of these principles (in particular, 2, 3, 4 and 7) lead us to the intent that a focus on constructivist research should define our pedagogy as well as a major part of our curriculum content. Our strong concern for teaching in ways consistent with learning as personal construction means our belief in the vital role of teaching in small, constant groups (which was the major organisation dimension of this course when it began in 1978) is even further enhanced. This structure is central to our conceptions of appropriate pedagogy in preservice programs. Another aspect of our intent for the implementation of the above principles has particular relevance to some of the issues below: this is our intent to maximise our students' contacts with school pupils and teachers through a variety of links other than teaching practice. These include teaching 1 grade 7 student, conducting field trips for grade 7 groups during our residential camp, teaching science in elementary (primary) schools during Australian Science in Schools week, etc. (Most of these additional experiences offer something to participating schools which is valued by the schools, a point to which we return later.) Both our research and our attempted implementations have been strongly influenced by the PEEL project (the Project for Enhancing Effective Learning; see Baird and Mitchell, 1986; Baird and Northfield, 1992).

A few aspects of the overall context of the program may be important in understanding the issues below and our approaches. The Monash program as a whole currently comprises two "foundations" subjects, Social Foundations of School ("SFS", a combination of the traditional preservice subjects Educational Sociology and History and Philosophy of Education) and Teaching and Learning ("TAL", a combination of the traditional subjects Educational Psychology and Principles of Teaching), two methods of teaching subjects, teaching practice with supervising (cooperating) teachers and a number of short service courses (eg. educational technology, using computers, first aid). Our program, that which represents our translation of research into practice, is concerned with preparing high school science teachers. It comprises a common science-teaching/learning-based component (which is more than a traditional general methods course; see Gunstone and Northfield, 1992 for examples of experiences), specific methods subjects in the sciences (those offered are Physics, Chemistry, Biology, General Science), science service (or "band aid") courses focussing on content and/or skills not learned in undergraduate science study and the foundations (TAL and SFS) and service courses and teaching practice described above. Our interest is to integrate **all** these components, including teaching practice, into a

single whole focussing on the development of the student teacher. One major element of our approach to integration is the use of constant seminar groups across all the integrated parts, except for specific methods (ie. Physics, Chemistry, etc), and a very strong reliance on seminar based teaching/learning in these constant groups rather than lecture based teaching. During the last fifteen years there have been periods where each of the two foundations subjects have been integrated via seminar groups (ie. a coordinated curriculum taught/learnt in these constant groups), but never have both been integrated at the same time. The program is a one year, end-on course with all students already being graduates from other University faculties. The bulk of our students are Science graduates (B.Sc. or higher degrees), but there is also always a small number of Engineering graduates.

Research into practice: Issues impacting on our attempts to implement the program

As noted above, we consider these issues (or problems) in two broad groups - those to which we have been unable to respond and those for which we have made some progress. There is some artificiality in this division of course.

Issues to which we have not yet been able to respond: Here we consider two influences of major impact on our intentions for which we have found no way to negotiate to reduce the impact of the influences.

The first of these issues is the overall program structure and approach. There are two sources of influence which we cannot affect here: the requirements of professional registration to teach in Victoria, and other Faculty staff. The first influence, registration, is mostly minimal as requirements are phrased very broadly (eg. "a balanced course of educational psychology ...."). These requirements do impact more on our relationships with teaching practice schools through those associated with the quality of teaching practice. We return to this in the next section. Much more important are other Faculty staff. Given the general cohesion of the science-related staff (methods staff who are also involved in the common science component and the science service courses, and some of whom currently teach in one of the foundations subjects, TAL), this influence is from non-science based staff.

Currently, the foundations subject, SFS, adopts curriculum and teaching structures that are not congruent with the principles set out earlier. This is clearly not a function of the content of this subject; in the early 1980s SFS was part of our integrated program. Indeed, at that time social issues were very much central to our integration and our program, largely because the staff responsible for this component began consideration of social issues via organised direct experience for our student teachers and then used our constant seminar

groups to weave social issues into close congruence with the rest of the program. The variable between then and now is staff, particularly staff philosophies and practices. The other foundations subject, TAL, was not integrated in the early 1980s; it did not exist. Educational Psychology was a separate subject, not at all congruent with our program. The creation and structure of TAL in the mid 1980s was strongly influenced by our program for science students, and incorporates some of our approaches from the early 1980s. Today, however, TAL runs with mixed-method groups. That is, TAL does not now function with our science-based seminar groups because of beliefs of some staff that mixed method seminars in this part of the program are more valuable than constant seminar groups of a more focussed method structure.

At the heart of both the SFS and TAL cases above is some staff holding different philosophies from us about preservice teacher education. "Right" and "wrong" are essentially irrelevant here; the issue is differences which our research cannot resolve to the satisfaction of all parties.

The second issue we consider in this section may appear to be another version of the first. It is non-sympathetic Faculty staff. We see this as separate from the first issue, and our reasons are made more obvious by taking the extreme case of non-sympathy. At various times in the life of our program, but not at the moment, there have been colleagues who have sought to have the Monash Education Faculty abandon preservice teacher education. The issue we refer to here then is not colleagues who, for various reasons, want to approach preservice teacher education in ways at odds with our philosophies. It is colleagues who are disinterested in preservice, and whose disinterest leads to action which constrains us in our approaches. Not surprisingly, this action can be to change our resources for preservice.

Issues to which we have, at least in part, been able to respond: There are three issues of significance here - the low academic status of preservice teacher education, the isolation of preservice from on-going professional development, and cooperating schools not seeing the importance we see in teaching practice. We consider these in turn by very briefly describing the issue and by considering our approaches to the reduction of the impact of that issue on our desired practice.

(i) Low academic status of preservice teacher education: This issue is a particularly significant one for staff on fixed-term contracts, both full time and part time. The issue results in pressure on these staff to back away from their preservice commitments and to publish. It is no longer an issue of substance for the two of us, except in terms of continually increasing Faculty demands for us to further expand our involvement in other Faculty

activities. We see the major reason for this issue not now being a significant one for us to be that we have over fifteen years closely integrated our preservice work with more "acceptable" academic activities (grants, research, writing). This has been done in ways which have enhanced our preservice work, and in ways which have attempted to explore preservice and inservice in complementary ways (eg. Baird et al., 1991; Baird and Northfield, 1992). Our approach to assisting fixed-term staff to deal with this issue is to attempt to provide support for these staff in using their preservice teaching/classroom research as a base for building more traditional academic pursuits, and to attempt to involve these staff in team research efforts outside the preservice context. This issue can only be addressed through fostering involvement in higher-status activities.

(ii) Isolation of preservice from on-going professional development: This issue can be of real impact on the nature of the teacher 1+ years after completing preservice. In its extreme form it manifests through school staffroom comments such as "What other rubbish did they tell you at University?". Approaches to reducing this impact are in principle obvious: preservice staff need credibility in the eyes of both school staff and preservice students; preservice staff need a strong inservice presence, and an inservice presence consistent with their preservice approaches. In practice we have undertaken a number of activities that have assisted in reducing the impact of these issues. We maintain links with our preservice students once they are teaching. (One of the many benefits of the constant seminar groups structure in which we work is the establishment of working relationships which often lead to on-going links. These links are maintained by our former students more than by us.) We are active in professional development work in schools. Particularly important here are our long-term commitments to two highly collaborative groups: the PEEL project (see above) and the Monash Children's Science Group (this network group is described in Gunstone and Northfield, 1988; see also Rudd and Gunstone, 1993 for an example of one teacher's professional development which began through her involvement in this group). As we have already suggested, these inservice involvements also feed back into our preservice teaching. We also teach in schools where possible. Some of this is relatively trivial, for example, teaching a "demonstration class" in a school as part of helping teachers understand the foci of professional development work we are undertaking in that school. (This, of course, is anything but trivial in terms of our credibility with teachers.) In 1993 one of us (JN) is teaching grade 7 mathematics and science for the academic year, a half-time commitment. (Our broad philosophies of inservice and their linkages with preservice are described in Gunstone and Northfield, 1988.)

(iii) Cooperating schools not seeing the importance we see in teaching practice; The potential impact of this issue on our intended program is obvious. If cooperating schools do **not** see teaching practice as important, then our students will **not** be encouraged to explore new teaching strategies (and other implications of the University program) in their classrooms, to participate in the broader life of the school, to observe a variety of classes, to undertake extra teaching activities, etc. One issue which impacts on the perceptions of teaching practice in some schools is that of the requirements of teacher registration, already mentioned. The relevant requirement is that student teachers have "45 days of supervised teaching practice in each method". This leads some schools to think in terms of only 45 days, and only in terms of classroom teaching in the student teacher's methods.

Our approaches here, of course, focus on helping schools accept and value our intentions for teaching practice, and to have schools recognise the potential value to them of our students' presence in the school. A small part of our approaches are those things outlined in discussion of the previous issue - involvement in professional development, being seen to be credible by teachers. Much more important and much more focussed on this issue is the development of a school-based group within our program. (See Northfield, 1988, 1989 for greater detail than is given here.) Instead of undertaking normal University work and a 3 week teaching practice block in one term, this group spends the full term in schools. This is not just extended teaching practice. It involves Monash staff working with the students in this school setting, linking the ideas we intend our students to think about with the daily experience of the school. The term is an integrated mix of the curriculum of the University program and teaching practice, with our students moving much closer to being school staff members than is otherwise the case. The school-based program is very popular with schools once they have experienced it. Essentially this is because of what the program offers the school - a number of full time additional staff with ideas and enthusiasm who are involved in the whole gamut of the normal school program. At the same time there is a Monash staff member taking responsibility for helping the students learn. Currently we have 21 students spread across four schools in the school-based program. It could be more students and more schools. Indeed, in the long term, we hope it will involve all our students. The major impediment is not the schools. Other schools than those now involved would like to work with us in this way. The problem is that which we raised earlier in this paper - other Monash staff do not share our belief in the value to student teacher development in the approach.

Conclusion

There is one board, common thread in our approaches to minimising influences on our intentions for the ways research should translate in the practice of our program. This is our changed conceptions of research (see, for example, Baird and Northfield, 1992; Gunstone et al., 1988) which result in our consistent valuing of the teacher-as-researcher perspective in our own teaching. In other words, the issues raised for us by the interplay of research and practice we attempt to see not as impediments but as further questions for research.

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